

REMARKS

The Examiner is thanked for the thorough examination of the present application. As an initial point, Applicant notes that claim 39 has not been rejected by the Office Action, and is therefore presumed to be allowed. Should any ensuing Office Action apply art to reject this claim, any such Office Action should be made non-Final, as any such rejection will constitute new grounds not necessitated by any amendment made to the claim.

Response to Rejections Under 35 U.S.C. 103 (a)

Claims 1-38 stand under 35 U.S.C. 103 (a) as allegedly obvious over Pierrat (US 6,811,935) or Friedrich (US 6,635,388) or Yamazoe (2003/0198872) in view of Lee (US 6,534,221). Applicant respectfully traverses the rejections made by the Examiner for the reasons discussed below.

The embodiments of the independent claims 1, 8, 16, 23, 31, and 32 define, among other features, that the optical thicknesses for each element are adjusted whereby any two adjacent elements in a given row and any two adjacent elements in a given column transmit light beams that **have a relative phase difference of 180 degrees**, thereby forming said final pattern. As an example, claim 1 specifically recites:

1. A method to form, on a reticle, a final pattern of an array of first elements, each of which has an optical thickness, comprising: forming a first pattern of said array on said reticle; adding additional second elements, that are between about 50 and 150% of said first elements, to said first pattern so that one second element is added to each end of each row of said array and one second element is added to each end of each column of said array; ***and adjusting said optical thickness for each element whereby any two adjacent elements in a given row and any two adjacent elements in a given column transmit light beams that have a relative phase difference of 180 degrees, thereby forming said final pattern.***

(*Emphasis added.*) Claim 1 patently defines over the cited art for at least the reason that the cited art fails to disclose the features emphasized above. The other independent claims embody similar distinguishing features.

The method of these claimed embodiments leads to less sensitivity to phase errors (departures from the zero or 180 degree phase difference that was intended for a given element). In the prior art designs, CD errors increase rapidly on either side of the plane of best focus and exceed acceptable limits starting at about 0.2 microns on either side of said plane. In contrast, in the designs of the present application, CD error is relatively insensitive to small phase errors over a range of about 0.3 microns on either side of the central focal plane. One reason the design of the claimed embodiments is less sensitive to phase errors is because all adjacent elements, including the dummy elements, have opposite phases.

As stated by the Examiner, neither Pierrat, Friedrich nor Yamazoe teaches the limitation “adjusting said optical thickness for each element whereby any two adjacent elements in a given row and any two adjacent elements in a given column transmit light beams that have a relative phase difference of 180 degrees”. The Examiner, however, alleges that Lee teaches adjusting the phase shift amounts by adjusting the thickness of the phase shift regions. Applicant respectfully disagrees.

In fact, Lee does not teach or suggest **adjusting the thickness of elements to force two adjacent elements having a relative phase shift difference of 180 degrees**. Thus, the limitation “adjusting said optical thickness for each element whereby any two adjacent elements in a given row and any two adjacent elements in a given column transmit light beams that have a relative phase difference of 180 degrees” as claimed in the claimed embodiments is not disclosed by Lee.

To establish a *prima facie* case of obviousness, the prior art reference (or references when combined) must teach or suggest all the claim limitations, according to MPEP 2143.

As discussed above, the prior art fails to disclose or render obvious all combinations defined in the independent claims of the invention. Accordingly, claims 1-38 are allowable over the cited references.

As a separate and independent basis for the patentability of all claims, Applicant respectfully traverses the rejections as failing to identify a proper basis for combining the cited references.

Even if the Examiner finds a reference teach adjusting the thickness of elements to force two adjacent elements having a relative phase shift difference of 180 degrees, in order to properly establish a *prima facie* case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine selected teachings from the references, according to MPEP 2143. Applicant respectfully submits that there is no suggestion or motivation, either in the cited references or in knowledge generally available to one of ordinary skill in the art, to adjusting the thickness of two adjacent phase shift elements of Pierrat (or Friedrich or Yamazoe) according to Lee's patent, and to force two adjacent elements having a relative phase shift difference of 180 degrees.

In combining these references, the Office Action stated only that the combination would have been obvious "because it is well known to adjust phase shifting regions by adjusting the thickness or material composition and contact holes are known to be different shapes including

rectangles and circles.” (Office Action, page 4). This alleged motivation is clearly improper in view of well-established Federal Circuit precedent.

It is well-settled law that in order to properly support an obviousness rejection under 35 U.S.C. § 103, there must have been some teaching in the prior art to suggest to one skilled in the art that the claimed invention would have been obvious. W. L. Gore & Associates, Inc. v. Garlock Thomas, Inc., 721 F.2d 1540, 1551 (Fed. Cir. 1983). More significantly,

"The consistent criteria for determination of obviousness is whether the prior art would have suggested to one of ordinary skill in the art that this [invention] should be carried out and would have a reasonable likelihood of success, viewed in light of the prior art. ..." Both the suggestion and the expectation of success must be founded in the prior art, not in the applicant's disclosure... In determining whether such a suggestion can fairly be gleaned from the prior art, the full field of the invention must be considered; for the person of ordinary skill in the art is charged with knowledge of the entire body of technological literature, including that which might lead away from the claimed invention."

(Emphasis added.) In re Dow Chemical Company, 837 F.2d 469, 473 (Fed. Cir. 1988).

In this regard, Applicant notes that there must not only be a suggestion to combine the functional or operational aspects of the combined references, but that the Federal Circuit also requires the prior art to suggest both the combination of elements and the structure resulting from the combination. Stiftung v. Renishaw PLC, 945 Fed.2d 1173 (Fed. Cir. 1991). Therefore, in order to sustain an obviousness rejection based upon a combination of any two or more prior art references, the prior art must properly suggest the desirability of combining the particular elements to derive a phase shift apparatus, as claimed by the Applicant.

When an obviousness determination is based on multiple prior art references, there must be a showing of some “teaching, suggestion, or reason” to combine the references. Gambro Lundia AB v. Baxter Healthcare Corp., 110 F.3d 1573, 1579, 42 USPQ2d 1378, 1383 (Fed. Cir.

1997) (also noting that the “absence of such a suggestion to combine is dispositive in an obviousness determination”).

Evidence of a suggestion, teaching, or motivation to combine prior art references may flow, inter alia, from the references themselves, the knowledge of one of ordinary skill in the art, or from the nature of the problem to be solved. See In re Dembiczak, 175 F.3d 994, 1000, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999). Although a reference need not expressly teach that the disclosure contained therein should be combined with another, the showing of combinability, in whatever form, must nevertheless be “clear and particular.” Dembiczak, 175 F.3d at 999, 50 USPQ2d at 1617.

If there was no motivation or suggestion to combine selective teachings from multiple prior art references, one of ordinary skill in the art would not have viewed the present invention as obvious. See In re Dance, 160 F.3d 1339, 1343, 48 USPQ2d 1635, 1637 (Fed. Cir. 1998); Gambro Lundia AB, 110 F.3d at 1579, 42 USPQ2d at 1383 (“The absence of such a suggestion to combine is dispositive in an obviousness determination.”).

Significantly, where there is no apparent disadvantage present in a particular prior art reference, then generally there can be no motivation to combine the teaching of another reference with the particular prior art reference. Winner Int'l Royalty Corp. v. Wang, No 98-1553 (Fed. Cir. January 27, 2000). The rationales relied on by the Office Action in the present application are merely generic statements, that have nothing to do specifically with the structures disclosed in the other references. As such, these rationales cannot be properly viewed as proper motivations for combining the specific teachings of the individual references. Indeed, the generic motivations advanced by the present Office Action could be used to support a combination of

ANY references, which is clearly contra to the cited Federal Circuit precedent and the clear intent of 35 U.S.C. § 103.

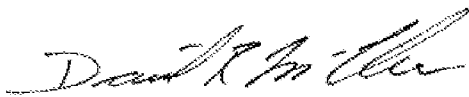
For at least the additional reason that the Office Action failed to identify proper motivations or suggestions for combining the various references to properly support the rejections under 35 U.S.C. § 103, those rejections should be withdrawn.

In view of the foregoing, it is believed that all pending claims are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

No fee is believed to be due in connection with this amendment and response to Office Action. If, however, any fee is believed to be due, you are hereby authorized to charge any such fee to deposit account No. 20-0778.

Respectfully submitted,

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